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EXAMINER

SILVERMAN, ERIC E

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1615

| MAIL DATE | DELIVERY MODE |
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06/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/019,797

Applicant(s)

GOPFERICH ET AL.

Examiner

Eric E. Silverman, PhD

Art Unit

1615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 12, 13 and 16-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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DETAILED ACTION

Applicant is advised that the Examiner assigned to this Application has changed. The Examiner currently assigned to this Application is **Eric Silverman, PhD**, whose contact information can be found at the end of this action. Applicant is further advised that this Application is currently assigned to **Art Unit 1615**.

Election/Restrictions

Applicants' election without traverse of Group I, claims 1 – 11, 14, and 15, in the paper filed 4/2/2007, is noted. Applicant also elected, without traverse, the hydrophobic species of polyester, the hydrophilic species of polyethylene glycol, and the substance d) species of carbohydrate. Applicants submitted that claims 1 – 11, 14, and 15 all read on the elected species.

In accord with this election, claims 12, 13, and 16 – 32 are withdrawn from consideration as being drawn to non-elected species or inventions. Claims 1 – 11, 14 and 15 are considered on the merits below.

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during

prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Claim Objections

Claim 11 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1, on which claim 11 depends, requires that group c) be an at least one bifunctional molecule with at least one free functional group. The claim and the specification explain that the free functional group has the future intended use of binding to a surface-modifying substance. Claim 11 requires that a surface-modifying substance be bound to the block copolymer. However, according to the specification, the surface-modifying substance binds by reaction with the at least one free functional group. The binding process renders the at least one free functional group to be no longer free. As such, claim 11, which requires that a surface-modifying substance be bound, does not appear to recite a block copolymer containing "at least one reactive group c) ... wherein the at least one reactive group c) is an at least bifunctional molecule with at least one free functional group." Since claim 11 does not recite a block copolymer containing the "at least one free functional group", as required by claim 1, claim 11 fails to further limit claim 1.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 10, and 11 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites, in part, "dicarboxylic acid amide". It is not clear if the claim intends to recite either a dicarboxylic acid or an amide as separate alternatives, or if the claim means a diamide, the diamide being a derivative of a dicarboxylic acid.

Claim 10 recites, in part, "preferably with a molar mass in a range of 1 000 to 100 000 Da". The recitation of "preferably" renders the claim indefinite, since it is not clear if the recited molar mass ranges are part of the claimed invention. During examination, claims are afforded their broadest reasonable interpretation; as such, this claim is being interpreted to read on any molar mass. Note that the claim as written uses a system of writing numbers that, while understandable, is not standard in the United States. It would be appreciated if Applicants would amend the claim to recite the number one thousand as "1,000" instead of "1 000", and make commensurate changes to other numbers throughout the specification and claims.

Claim 11 recites, in part, "chemically structured". It is not clear what is meant by this term, nor is it defined in the specification. The artisan would not know what constitutes a "chemically structured" block copolymer, and thus would be unable to determine the metes and bounds of this claim. The claim also recites, in part, "by binding of surface-modifying substances d)". It is not clear if Applicants' intend to recite

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a product-by-process claim when using the language "by binding of". If so, the claim should be amended to recite a clear process step.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 7, 9 – 11, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 95/03356 ('WO' or the 'WO reference').

Claim 1 recites a block copolymer comprising a hydrophobic polymer (a), a hydrophilic polymer (b), at least one reactive group (c), wherein (c) is a molecule that is at least bifunctional and has at least one free functional group.

Claims 3 – 6 limit the nature of components (a), (b) and (c). The elected species of (a) – polyester and (b) – PEG, are included in these claims. Claim 7 limits the nature of the polyester, and claim 8 reads on PEG. Claim 10 further limits the nature of the polyester, requiring that it be polylactide. Claim 11 requires that the copolymer be "structured" by binding of a "surface-modifying substance[s] d)". Claim 14 requires a shaped body formed from the copolymer, and claim 15 specifies the nature of that body, including forms such as particles.

Note that with respect to substance (d), this rejection is applied to the generic claim. The elected species of carbohydrates is addressed in rejections under 35 U.S.C. 103(a), *infra*.

The WO reference teaches in Example 15, Figure 2f, compound K, and descriptions of this figure, the claimed block copolymer. The block copolymer in the figure has blocks of PEG (hydrophilic substance b)) and of polylactide (PLA –

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hydrophobic substance a)). The blocks are linked by a diamide molecule which has free, unreacted alcohol groups (bifunctional molecule c)). The unreacted alcohol groups are then bound to ligands, which are understood to read on the "surface-modifying substances d)" of claim 11. In the abstract, the WO reference teaches making particles or nanoparticles out of the polymers. Examples 20 – 22 and claims 6 – 19 also teach particles made from the polymers, reading on the particles of instant claims 14 and 15.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 95/03356 ('WO' or the 'WO reference').

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With respect to claim 9, note that the WO reference anticipates the genus of “surface-modifying substance d)”. This rejection is advanced with respect to the elected species of carbohydrate.

Claim 9 requires that the PEG have a molecular mass in a range of 200 – 10,000 daltons.

The limitations of claim 11 were discussed previously.

Some of the teachings of the WO reference were discussed previously. The WO reference teaches that, in making the polymer that reads on instant claims (example 15) methoxy-PEG-amine is used. Although the molecular weight of the PEG is not mentioned in example 15, in other examples where similar polymers are made, the PEG molecular weight is within the instantly recited range, such as 1,900 Da (Example 6), 5,000 Da (examples 1, 6, 8, 9, and 10).

WO does not specifically require the PEG molecular weights of claim 9 in the polymer of example 15.

With respect to claim 9, it would be prime facie obvious to a person of ordinary skill in the art at the time of the invention to use PEG that has a molecular weight from 200 – 10,000 Da. The motivation comes from the WO reference, which suggests the use of PEG having molecular weight in this range for making similar polymers. Because the other polymers are made by the same type of synthetic methodologies as that in Example 15, the artisan would enjoy a reasonable expectation of success.

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The WO reference also suggests modifying the surface of the nanoparticles by coating them with dextran, a carbohydrate (page 26, lines 24 – 33). Such nanoparticles are said to be useful for MRI.

The WO reference does not specifically apply a dextran (or other carbohydrate) to the surface of particles made from the polymers of example 15.

It would be prime facie obvious to a person of ordinary skill in the art at the time of the invention to use dextran instead of a ligand to modify the surface of the particles. The motivation comes from WO, which teaches that this modification would make the particles useful for MRI. Since this modification is an express suggestion of the art, the artisan would enjoy a reasonable expectation of success.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 95/03356 ('WO' or the 'WO reference') in view of US 4,904,479 to Illum.

With respect to claim 9, note that the WO reference anticipates the genus of "surface-modifying substance d)". This rejection is advanced with respect to the elected species of carbohydrate.

Some of the teachings of WO have been discussed above. WO also teaches that the ligands are attached in order to target specific tissues (page 27, lines 1 – 13). However, WO is generic with respect to the nature of the ligands to be used.

Illum teaches particles for drug delivery (abstract). Illum also teaches targeting these particles to particular sites in the body (col. 1, lines 1 – 14) by attaching ligands thereto. Illum teaches that ligands suitable for this purpose include lectins and sugars, which are carbohydrates.

It would be prime facie obvious to a person of ordinary skill in the art at the time of the invention to use a lectin or sugar as the ligand in the polymer of WO. The motivation comes from Illium, who teaches that these ligands are suitable for the same purpose for which WO generically suggests the use of a ligand. See MPEP 2144.07.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 95/03356 ('WO' or the 'WO reference') in view of US 5,543,158 to Gref et al.

Some of the teachings of the WO reference were discussed previously. The WO reference also teaches that the particles produced therein are designed to have a prolonged half-life in the blood stream because of the use of PEG on the surface of the particles.

WO does not teach the molecular weight of PEG.

Gref teaches particles that have increased half-life in the blood stream because of the presence of PEG on the surface (abstract, figures, col. 1). Gref teaches that suitable PEG has a degree of polymerization from 8 to 500, preferably from 40 to 500. This corresponds to molecular mass of 384 Da to 24,000 Da, or preferably 1,920 Da to 24,000 Da (col. 6, lines 50 – 61). Gref also teaches that PEG of molecular weight 5,000 is appropriate (col. 9, lines 45 – 61, Example 2).

It would be prime facie obvious to a person of ordinary skill in the art at the time of the invention to use PEG having a molecular mass between 200 and 10,000 Da. The motivation comes from Gref, who teaches that PEG with molecular weights in this range are suitable for the purposes of WO. The artisan would thus have a reasonable expectation of success. See MPEP 2144.07.

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Conclusion

No claims are allowed.

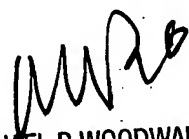
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,660,851 is made of record because it was cited on a search report in a related foreign application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric E. Silverman, PhD whose telephone number is 571 272 5549. The examiner can normally be reached on Monday to Friday 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on 571 272 8373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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